



Albatros

This is one twin where you don't have to worry about cleaning up the "goo" after each flight, and it's quiet.

I guess we all have a reason for building a particular model; this one was no different. It was made for several reasons. My love for seaplanes, electric power, and low cost. Ease of construction was a major factor.

After looking for ages for the right model to build, I decided to go all out and design my own. Then I felt, why build a model and then have to build a set of floats. There must be hundreds of these around. After all, there are two types of airplanes that fly off of water. The Answer: **"Build a flying boat."** These are basically more difficult to build and not so easy to fly. Low speed taxiing is generally marginal. Therefore, we must have a large water rudder in order to have full control at low speeds on water; especially when taxiing crosswind. Well, so far, so good.

Earlier on, I had decided to use electric power. That means pylon construction, alignment problems, etc., -- too complicated. Also it had to look like an aircraft . . . scale-like.

The alternative; two motors mounted in nacelles on top of the wing. Weight is then concentrated lower, more power is available for minor weight increase over a



By Henry Bolzenius

ALBATROS

Designed By:

Henry Bolzenius

TYPE AIRCRAFT

Electric Flying Boat

WINGSPAN

63 Inches

WING CHORD

8 Inches

TOTAL WING AREA

504 Sq. In.

WING LOCATION

Top of Fuselage

AIRFOIL

Flat Bottom

WING PLANFORM

Constant Chord

DIHEDRAL, EACH TIP

1-3/16 Inches

OVERALL FUSELAGE LENGTH

42 1/2 Inches

RADIO COMPARTMENT SIZE

(L) 17 1/2" x (W) 3 1/4" x (H) 4"

STABILIZER SPAN

21 1/4 Inches

STABILIZER CHORD (incl. elev.)

5 1/4 Inches (Avg.)

STABILIZER AREA

105 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Center of Vertical Fin

VERTICAL FIN HEIGHT

10 1/2 Inches

VERTICAL FIN WIDTH (incl. rud.)

5 3/4 Inches (Avg.)

REC. MOTOR SIZE

05 x 2 (Electric)

BATTERY SIZE

14 Sanyo 1700 mA SCE cells

LANDING GEAR

NA

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

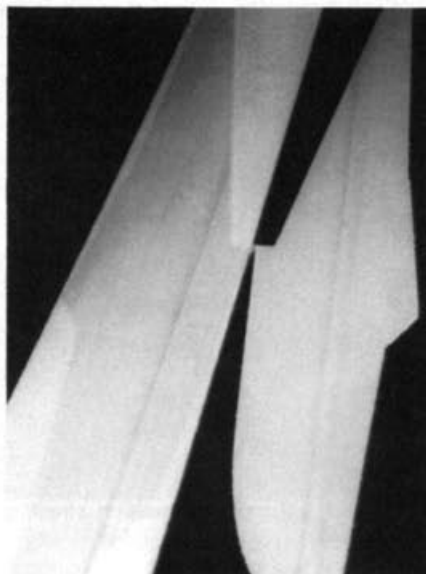
Rud., Elev., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

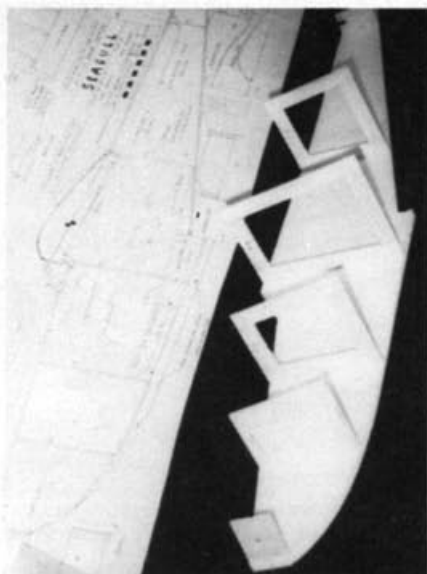
Fuselage	Foam, Balsa, & Ply
Wing	Balsa & Ply
Empennage	Balsa
Wt. Ready To Fly	83.9 Ozs. (5 Lbs. 3.9 Ozs.)
Wing Loading	23.9 Oz./Sq. Ft.

larger, single motor. An electric seaplane must be lightweight and waterproof. That's the reason for using white foam as the major component in the construction of the hull. A side benefit is built-in floatation. Also, the lamination of foam and balsa makes for a very strong hull at minimum cost.

Just then I came across an article on electric twins in another model magazine. After studying all the facts, I knew I was on the right track. To keep in line with ease of construction, it had to be a flat bottom fuselage (oops hull). But, from what I've seen, they are somewhat skittish on the water so I figured, why not some sort of tunnel hull. Better directional stability on water, less chance of spray getting into the props, and the flow of air under the hull should help ease it from the surface, rather than leaping off, like so many do. After all this exercise of the "gray matter," it was time to put these ideas on paper . . . Well, here is what came of it.



LEFT: Balsa sides are first cut to shape, then glued to the 5/16" thick foam boards using contact cement. **Note:** Be sure to use only foam safe glues. **RIGHT:** With the formers all glued in place on one side, you can join the two sides together.

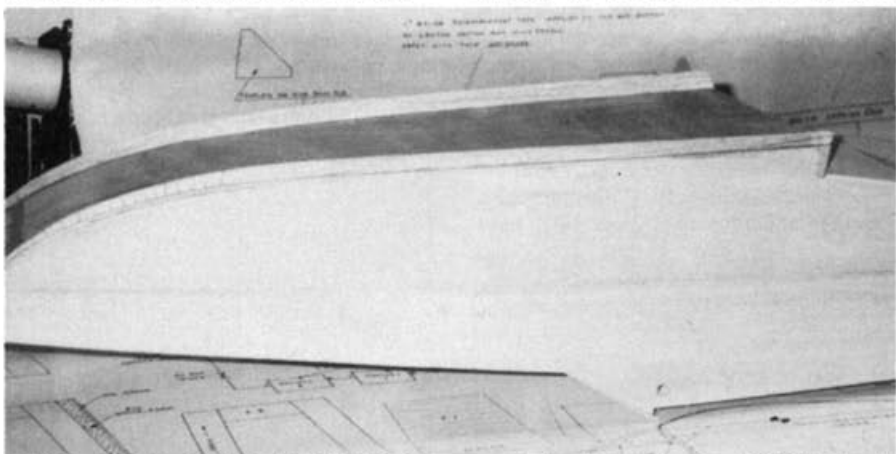


CONSTRUCTION

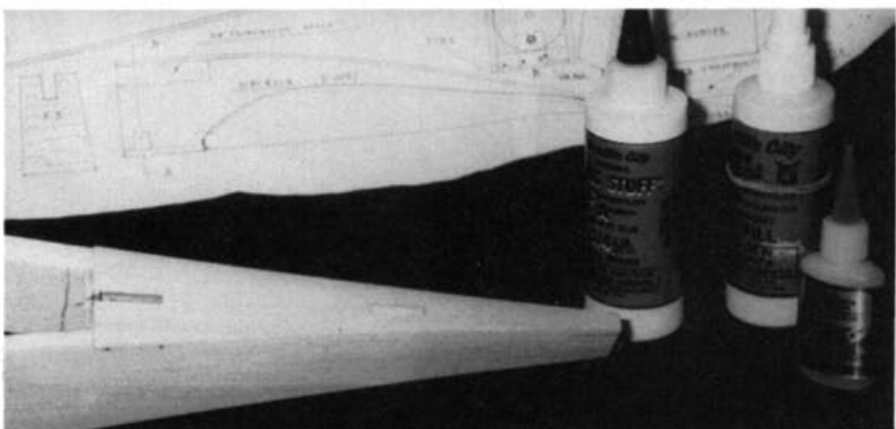
Hull:

Take four sheets of 1/16" x 3" x 48" balsa and glue together to make two 6" x 48" sheets. Cut 1/16" balsa sides to plan shape. From 2" thick white foam, cut two sheets approximately 7" x 44" using two lengths of 5/16" spruce or hard balsa (whatever is available), fastened to the 2"

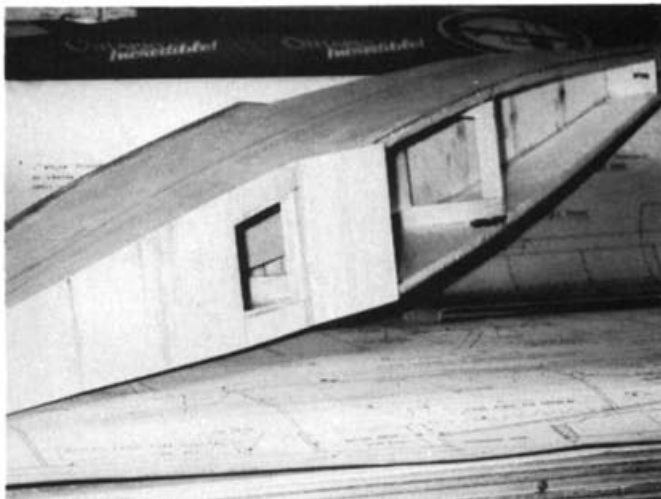
foam with 2 1/2" nails; and then hot wire cut two sheets 5/16" thick (same technique as cutting foam core wings). The next step is to use foam compatible contact cement (I've used "Scotch Brand" Super 77 Spray Adhesive) and glue the 1/16" balsa sides to the foam. **Make one left and one right.** Cut the foam to the outline of the balsa with a Stanley or X-Acto knife. (Keep cuts



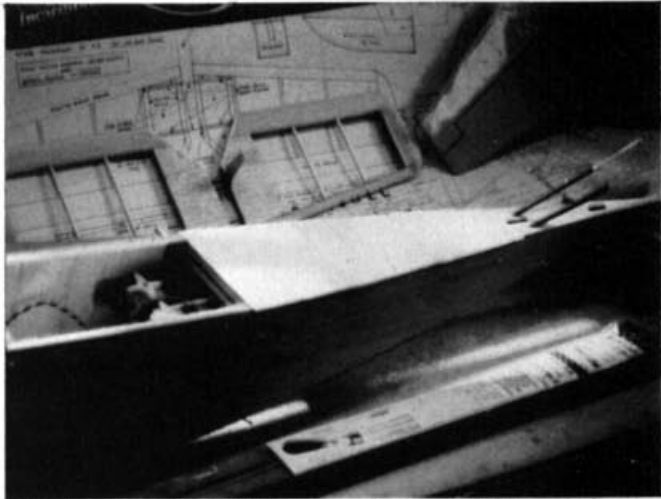
Bottom of hull is sheeted with 1/16" ply from nose to step. From step back, 3/32" balsa is used, cross-grain.



Top/rear of hull is sheeted with 3/32" balsa, with the grain running lengthwise. Holes are for vertical fin installation.



LEFT: Top/front sheeting is installed cross-grain. **RIGHT:** Top/center section sheeting is glued in place after rudder and elevator pushrods are secured inside fuselage and at exit points.



vertical!) There you have it; the hardest part of the hull construction is behind you.

Proceed with gluing formers F3 and F4 in position, then pull the tail end (taper the foam so the extreme end of the hull is 3/8" wide) and the nose together, and glue. Make sure you have a straight hull (a banana will always behave like one). When you're satisfied with the fore and aft alignment, glue in formers F1, F2, and F5. Now install the step block with triangular stock in position as per plan. You're now ready to sheet the hull bottom with 3/32" balsa, cross-grain. Next glue 1/16" ply bottom from step to nose. Sheet top of hull with 3/32" balsa, grain lengthwise from front of former F5 to rear of hull. Cut slots for fin and alignment tabs.

Fin and Rudder:

Build the fin and rudder directly over the plan. Glue two sheets of 1/4" medium balsa together and glue to 1/2" x 1/4" hard

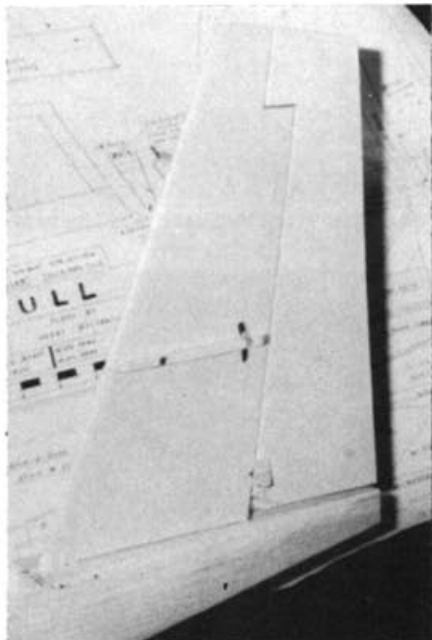
balsa. Cut to size shown on plan. Build rudder from 1/4" medium balsa strips and sand to shape. Trial fit fin on hull but do **not** glue at this stage. Glue 1/4" x 3/8" balsa strips along each side of fin (see plan). Install 1/8" o.d. brass tube and cut crescent shaped hole for stab movement.

Stabilizer Construction:

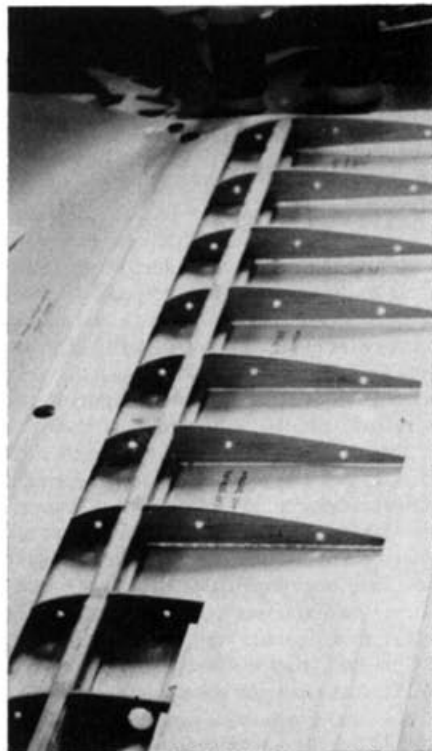
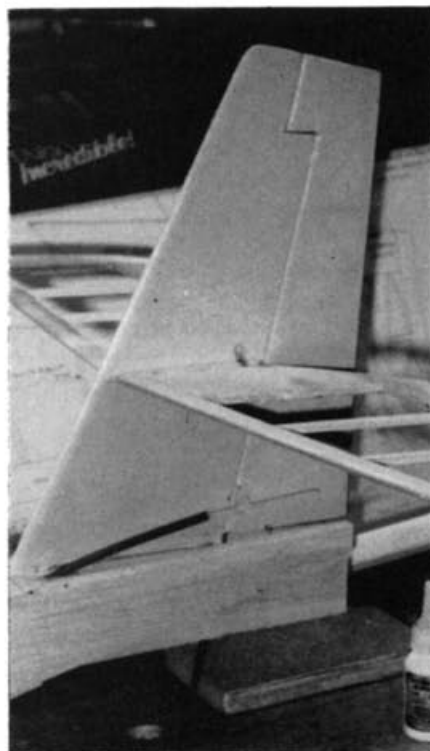
Build up stab from 3/16" balsa strips directly over plan. Take extra care with the alignment of 1/8" o.d. brass tubing. The easy way is to fit and glue 1/32" balsa between 3/16" x 1/4" balsa ribs. Cut two 1/8" o.d. brass tubes 4 1/4" long and epoxy in place in position shown on plan. Fill in spaces around 1/8" o.d. brass tubing marked (X), with 1/8" balsa. Next, fit and glue 1/32" balsa on top & in spaces marked

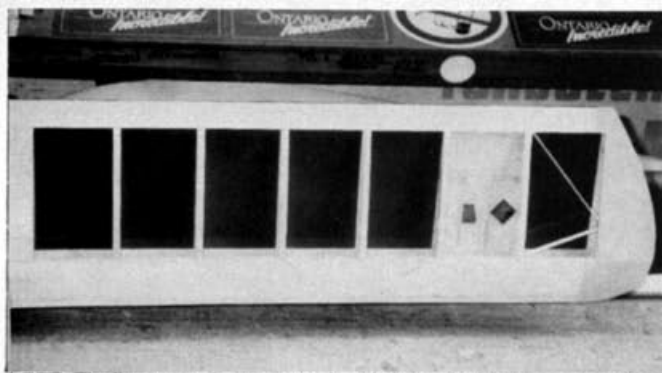
(X) on top of brass tubing, flush with outside of stab root ribs. Alignment is guaranteed! Notch right root rib for the elevator horn.

For a change of activity, install servos in hull forward of former F4. Fit control rods in place as per plan. Now sheet the top of the hull with 3/32" balsa (cross-grain) from F4 to F5 and front from N to F3 with 1/16" balsa. Glue on nose block. Cut hatch in position shown. Build water rudder from 1/32" plywood as per plan. No soldering of traditional brass rudder and 90% lighter. From 2" white foam (left over from hull construction) cut two wing floats. A hacksaw blade works well for this, then sheet entire floats with 1/16" balsa. Make two float struts from 1/4" hard balsa as per



LEFT: Vertical fin is 1/4" sheet balsa; rudder is built-up from 1/4" balsa sticks. Note slot for stabilizer pivot. **CENTER:** The stabilizer is built-up from 3/16" balsa stock. Left and right halves are joined using music wire and brass tubes. Water rudder torque rod is attached to rudder, awaiting final assembly of water rudder. **RIGHT:** Wing panels use basic "D" tube construction with 1/16" balsa sheeting on L.E., T.E., and center section.





LEFT: Tip float attachment area is reinforced with 1/16" ply. **RIGHT:** Engine nacelles are added to the assembled wing after the wiring is routed out to each motor location.

Wing Construction:

dihedral brace. Begin building.

Lay 1/16" bottom sheets over plan and glue in bottom spar. Epoxy dihedral brace centered on top of spar. Add R1 and R1A ribs, then glue in top spar. Fill T.E. with scrap balsa as shown. Add top sheeting. Glue on 1/2" x 3/4" L.E. Remove from plan. Sand L.E. to shape.

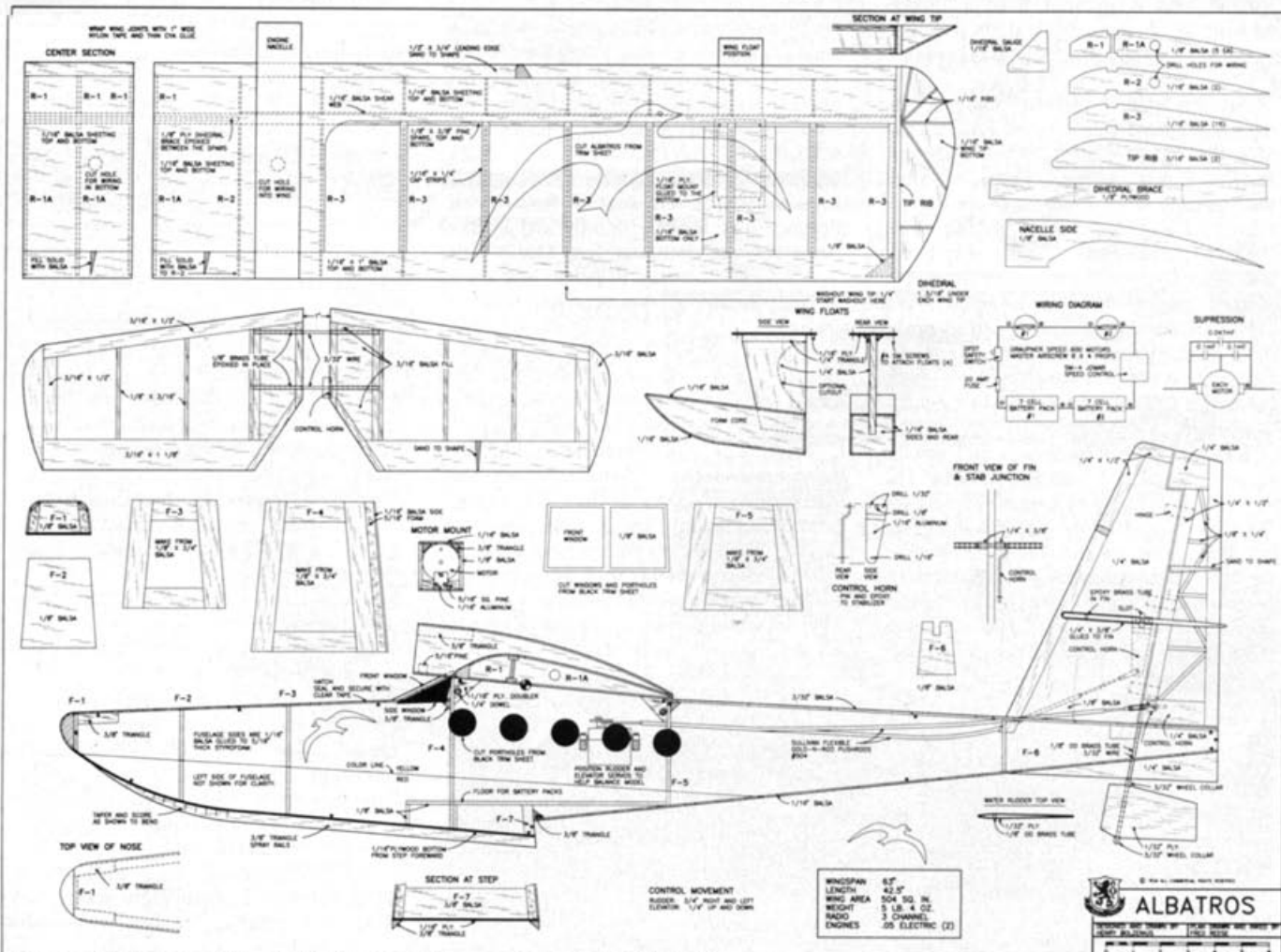
Nacelles: (two required)

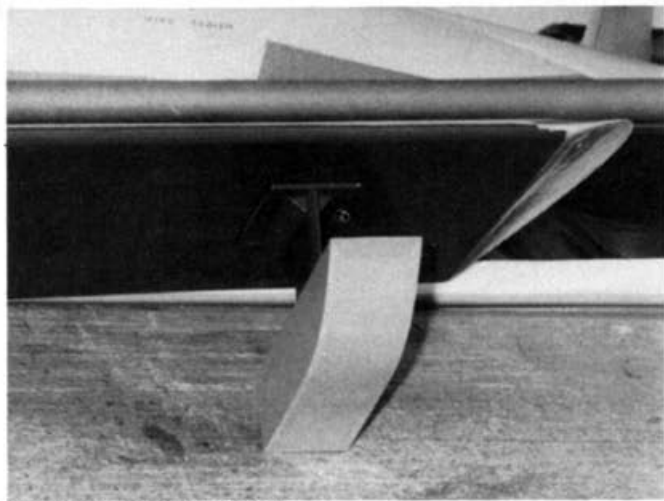
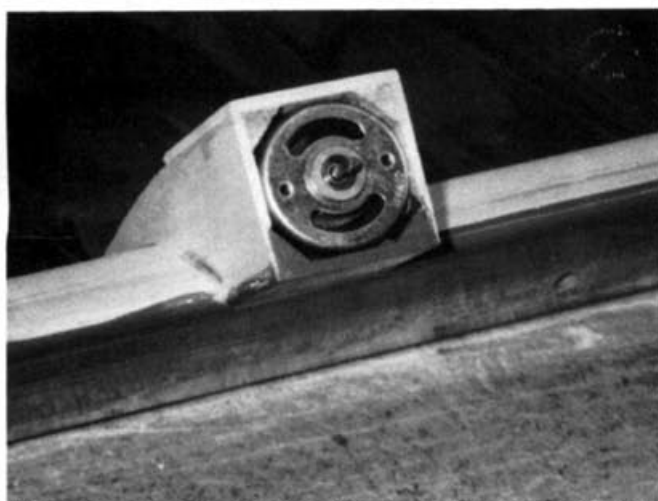
Build as per plan and glue in position after wiring.

Right Wing Panel:

Lay 1/16" bottom sheeting over plan and glue in bottom spar using ribs for location. Glue in ribs. Use wing root template on root rib to obtain angle for dihedral. Add top spar

and top T.E. sheeting. Glue shear webs between ribs 2 to 10 and in front of spar (grain vertical). Glue 1/8" balsa strips between spars, and between ribs 1 and 2 flush with front and rear of spars to create a box. Check with scrap piece of 1/8" plywood. This box will later accept the ends of the dihedral brace when joining the panels to the center section. Fill space in T.E. as per center section between root rib 1 and rib 2. Do **not** fit top sheeting until motor wiring is in place, otherwise you'll have some fun. The same holds true for the nacelles. Again, **glue only after wiring**. Fit and install capstrips. Glue on L.E., remove wing panel from plan and add bottom capstrips. Glue 2 3/8" x 4 1/4" x 1/16" balsa





LEFT: Two stock 05 electric motors provide plenty of thrust. RIGHT: Tip float attachment detail.

piece in position (see plan). Sand L.E. to shape. Add tip rib and sand to wing shape. Glue 1/16" ply (wing float mounting plate) to bottom of 2 3/4" x 4 7/8" x 1/16" balsa piece as per plan. Build left wing panel in the same way as the right one. Join wing panels and center section (use epoxy) and wrap joints with 1" nylon tape. I used "Carl Goldberg" tape applied with thin "Hot Stuff." Apply washout when covering wing. **Do not omit this step.**

Waterproofing:

To seal hull at wing joint, wrap center of wing in Saran Wrap, apply bead of silicone on wing saddle and strap wing in position. Let cure overnight.

Flying:

The day finally arrived; some of the regular seaplane fliers, Frank Powell, Jim Mulcahy, Sam Holmes (79 years young), and Phil Collings to name just a few, were there already when I arrived at our regular venue, Lake Adkinson. After such "friendly" comments, "Looks okay mate, it'll never fly, you'll electrocute yourself" etc., etc., there wasn't much I could do but to put their minds at ease and possibly prove them right. After checking that the model balanced properly at the C.G. (2 3/4" back from the L.E.), and range testing the equipment, it was time to fly.

A quick top-up of the battery pack and the model was placed into its element. The Albatros floats relatively high. Taxiing the model, I found that low speed handling was excellent. Must be that big water rudder. Spray's no problem, never reaches the props. With nothing else to check, full up elevator was held while throttle was advanced to full. The Albatros raised her

nose, accelerated, and was on step within 20-25 feet. The speed increased and after another 15 feet or so she lifted from the water. Relax up elevator and climb to about 200 feet. Model's rock-steady. Feeding in some right rudder, she went into a banking turn, still climbing. Reduce throttle to about half, she settles down to level flight. Cruising at about 200 feet, trying right and left turns with just slight up elevator. None of that "tail-down syndrome" in turns inherent to most flying boats. Low passes and touch and go's are great. The Albatros is very stable at all speeds and is a dream to fly. It's not an aerobatic model, but does what it's supposed to do; easy take offs, no vices! Touch and go's are easy and great fun. Low passes, two feet high makes it all worthwhile. The "Albatros" will loop from level flight in the earlier part of its flight without a problem; later on a little dive is needed. Set up the landing from a fair distance out. Reduce throttle and let her come down to about two feet. Gently flair with a slight increase in power and she's down without a bounce. **Oh, what a feeling!**

Airtime on 1700 SCE's is about 10 minutes, mostly cruising at just below half power and with three or four touch and go's. A very rewarding project.

All things considered, I would **not** recommend the "Albatros" to the inexperienced builder or flier. But anyone who can build, fly, and do touch and go's with a Carl Goldberg Falcon 56 or J-3 Cub, will have no problems with the Albatros.

There you have it! Go ahead and join the ever increasing ranks of electric fliers and do it clean and quietly. See yah.

EQUIPMENT USED IN MY MODEL:

Radio/Motors:

JR x-347 PCM tx
Homebuilt 7 ch. rx
Built by Malcolm Aldred
Two Futaba S 9601 servos 2 oz.
Sanyo 550 mA rx battery
Sanyo 1700 SCE batteries
Jomar SM — 4 controller 1 1/2 oz.
Graupner Speed, 600, 8.4 volt. Order #GR 3301 from Hobby Lobby (or equivalent)

PARTS LIST:

Hull, Fin, and Rudder:

- 2 — 3" x 3/32" x 36" medium balsa
- 4 — 3" x 1/16" x 48" medium balsa
- 2 — 5/16" sq. spruce
- 2 — 3" x 1/8" x 36" hard balsa
- 1 — 1/2" x 1/4" x 36" hard balsa
- 1 — 3" x 1/4" x 36" medium balsa
- 2 — 3/8" x 3/8" balsa tri. stock
- 1 — 12" x 1/16" x 36" ply
- 1 — 12" x 2" x 48" white foam

Stab:

- 1 — 3" x 3/16" x 36" medium balsa
- 1 — 1/8" o.d. x 12" brass tubing
- 1 — 3/32" dia. piano wire
- 2 — 1/8" wheel collars for water rudder
- 1 — 2" x 1/32" x 36" medium balsa
- Screw aluminum for elevator horn

Wing:

- 2 — 3" x 1/16" x 36" hard balsa (ribs)
- 1 — 3" x 1/8" x 36" hard balsa (ribs)
- 1 — 3" x 3/16" x 36" medium balsa (tip ribs)
- 2 — 4" x 1/16" x 36" medium balsa (wing sheeting)
- 6 — 3" x 1/16" x 36" medium balsa (wing sheeting)
- 4 — 1/8" x 3/8" x 36" spruce (spars)
- 1 — 2" x 1/2" x 36" medium balsa (L.E.)
- 1 — 12" x 6" x 1/8" ply (dihedral brace)

Covering:

- Superkote from Hobby Lobby
- 2 — rolls Champion yellow
- 1 — roll Beechcraft red
- 1 — trim sheet black
- Black Albatros Emblem **right wing**
- Name and smaller emblem **both sides of hull.**

